



Interactive comment on “Source apportionment using LOTOS-EUROS: module description and evaluation” by R. Kranenburg et al.

Anonymous Referee #2

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This paper presents a method for attributing tropospheric distributions to sources in a regional chemical transport model. I think the subject of this paper is appropriate for GMD, however I do not feel it is ready for publication. I do not completely understand the procedure used, and think the authors need to significantly improve and expand the description of the procedure. My specific comments are listed below.

1. Introduction: How does this procedure compare to other tagging methods, such as:

Grewe, V.: Technical Note: A diagnostic for ozone contributions of various NO_x emissions in multi-decadal chemistry-climate model simulations, *Atmos. Chem. Phys.*, 4, 729–736, doi:<http://dx.doi.org/10.5194/acp-4-729-2004>, 2004.

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Dahlmann, K., Grewe, V., Ponater, M., and Matthes, S.: Quantifying the contributions of individual NO_x sources to the trend in ozone radiative forcing, *Atmos. Environ.*, 45, 2860–2868, 2011.

Grewe, V., Tsati, E., and Hoor, P.: On the attribution of contributions of atmospheric trace gases to emissions in atmospheric model applications, *Geosci. Model Dev.*, 3, 487–499, doi:<http://dx.doi.org/10.5194/gmd-3-487-2010>, 2010.

Butler, T.M., Lawrence, M. G., Taraborrelli, D., and Lelieveld, J.: Multi-day ozone production potential of volatile organic compounds calculated with a tagging approach, *Atmos. Environ.*, 45, 4082–4090, 2011.

Emmons, L. K., Hess, P. G., Lamarque, J.-F., and Pfister, G. G.: Tagged ozone mechanism for MOZART-4, CAM-chem and other chemical transport models, *Geosci. Model Dev.*, 5, 1531–1542, doi:[10.5194/gmd-5-1531-2012](http://dx.doi.org/10.5194/gmd-5-1531-2012), 2012.

2. In Section 3, please be more specific about which modeled compounds are "labeled". Is it all species for a type of source, or for a specific region? Or is a single species traced at one time? It is not clear how many "labels" there can be in a single simulation. A few more explicit examples would be helpful.

3. Perhaps the transport process "Adjust" should be called "Adjustment", to use a noun as for the other processes.

4. The Fig.8 caption includes some extraneous text (referring to upper left, etc.). And what is the BOP-campaign? That should be described in the text.

5. There are a number of grammar or typo errors that should be corrected. For example:

p. 3959, l. 22: "provides a good insight for" -> "provides insight into ..."

p. 3960, l.7: "track off" -> "track of"

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p. 3960, l. 13: "inspired on" -> "inspired by"

p. 3974, l 7 & 9: "extend" -> "extent"; l.10: "reduction on" -> "reduction in"

etc.

Interactive comment on Geosci. Model Dev. Discuss., 5, 3957, 2012.

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